CLAIMS

1. A load measuring unit for a rolling bearing unit comprising:

a stationary ring;

a rotating ring arranged concentrically with the stationary ring;

a plurality of rolling elements provided rotatably between stationary-side raceways and rotating-side raceways, which are formed on mutual opposing portions of the stationary ring and the rotating ring in two rows or more respectively, respectively to direct a contact angle in an opposite direction mutually at least between a pair of rows;

at least a pair of revolution speed sensors for sensing revolution speeds of rolling elements, directions of contact angles of which are different mutually, in a pair of rows respectively; and

a calculator for calculating a load applied between the stationary ring and the rotating ring based on sensed signals fed from the revolution speed sensors;

wherein the contact angles of the rolling elements are differentiated mutually in respective rows.

2. A load measuring unit for a rolling bearing unit according to claim 1, wherein the rotating ring is a hub that fixes a wheel of a car to a rotary-side flange,

which is fixed to an outer peripheral surface of an outer end portion in an axial direction, to rotate together with the wheel, and the contact angle of the rolling element in an inner tow in the axial direction are set larger than the contact angle of the rolling element in an outer row in the axial direction.

3. A load measuring unit for a rolling bearing unit comprising:

a stationary ring;

a rotating ring arranged concentrically with the stationary ring;

a plurality of 0rolling elements provided rotatably between stationary-side raceways and rotating-side raceways, which are formed on mutual opposing portions of the stationary ring and the rotating ring in two rows or more respectively, respectively to direct a contact angle in an opposite direction mutually at least between a pair of rows;

at least a pair of revolution speed sensors for sensing revolution speeds of rolling elements, directions of contact angles of which are different mutually, in a pair of rows respectively; and

a calculator for calculating a load applied between the stationary ring and the rotating ring based on sensed signals fed from the revolution speed sensors;

wherein an expression representing a relationship between a variation of the load and an amount of change in the revolution speeds of the rolling elements in respective rows based on a displacement of the load applied between the stationary ring and the rotating ring is installed into the calculator, and the calculator calculates the load based on the expression.

4. A load measuring unit for a rolling bearing unit according to claim 3, wherein the rotating ring is a hub that fixes a wheel of a car to a rotary-side flange, which is fixed to an outer peripheral surface of an outer end portion in an axial direction, to rotate together with the wheel.

5. A load measuring unit for a rolling bearing unit according to any one of claims 1 to 4, wherein one raceway ring out of the stationary ring and the rotating ring is an outer ring equivalent member, other raceway ring is an inner ring equivalent member, each rolling element is a ball, and a back-to-back arrangement type contact angle is given to a plurality of balls provided respectively between double row angular contact inner ring raceways formed on an outer peripheral surface of the inner ring equivalent member and double row angular contact outer ring raceways formed on an inner peripheral surface of the outer ring equivalent member.

6. A load measuring unit for a rolling bearing unit according to any one of claims 1 to 5, further comprising:

a rotational speed sensor for sensing rotational speed of the rotating ring,

wherein the calculator calculates the rotational speed of the rotating ring based on signals fed from the rotational speed sensor, and calculates the load applied between the stationary ring and the rotating ring based on ratios of the revolution speeds of the rolling elements in respective rows to the rotational speed.